

**DURHAM DEVELOPMENT REVIEW**  
**D1500101 Duke University Central Generation Plant #3**  
**LEVEL 3 SITE PLAN**  
**1<sup>st</sup> Review**

The following are the review comments and corrections for the above referenced plan. Comments are not final until 5:00 pm on the published due date and may be subject to change prior to that time:

**PLEASE NOTE:** Departments that approve this case may not include a “No Comments” in this document. If you do not see comments for a particular department, please check the Approvals in Land Development Office on-line. If the approval has not been given, then comments are still pending.

**RE-REVIEW FEES:**

The initial submittal fee is valid for the first three consecutive review submittals. Comments generated for any reviews submitted after the 3<sup>rd</sup> review (2<sup>nd</sup> re-review) will incur re-review fees in the amount of half the original submittal fee, plus 4% technology surcharges.

**Re-review fee:**

**Re-submittal deadline: 8/20/2015**

**PLANNING**

**Nia Rodgers 560-4137 ext 28234**

5/22/2015

1. Add the planning department case number D1500101 above the approval stamping area, per the requirements of the site plan checklist.  
**RESPONSE: Planning department case number has been added on G-001.**
2. Per the requirements of the site plan checklist, place this note in the Special Conditions of Approval Box: Owner/developer shall notify the Durham City County Planning Department Site Compliance staff at the completion of construction and landscaping to request an inspection prior to use of the facility.  
**RESPONSE: Note has been added on G-001.**
3. Show the dimension of the new generator from the existing building per the requirements of the site plan checklist.  
**RESPONSE: New Generator has been identified and dimensioned on C-201. Generator is 12' from edge of building.**
4. Per UDO section 8.3.1.B.3, No tree coverage is required in non-residential districts in the urban tier, please revise the required and proposed tree coverage shown in the site data table on the cover to “N/A”.  
**RESPONSE: Site Data Table has been updated to remove tree coverage requirements on G-001.**
5. Enlarge the notes on the tree protection detail, shown on sheet C-401 so that they are legible.  
**RESPONSE: Standard tree protection detail has been scaled up so that notes are legible on C-401.**

**CITY ENGINEERING**

**NAME HERE, Engineering Development Review 560-4326**

[Date of comments]

**TRANSPORTATION**

**Bill Judge, P.E. 560-4366 ext. 36420**

5/22/2015

1. No comments. Approved.

**CITY STORMWATER**

**NAME HERE, Stormwater Development Review 560-4326**

May 22, 2015

TO: Nia Rodgers, Planning Department

FROM: Jennifer Buzun, PE, Stormwater Services  
Email: jennifer.buzun@durhamnc.gov

SUBJECT: Duke University Central Generation Plant #3 - Review #1  
Case # D1500101 Case History:  
PIN: 0811-05-69-9253  
Address: 2100 Duke University Road (Wannamaker Drive)

<b>Watershed Protection Overlay</b>	None
<b>Stormwater Regulatory Basin</b>	Jordan Lake
<b>Cumulative Disturbed Area Since Baseline Date</b>	0.43 acres for this project, but Duke as a whole is over the disturbance threshold
<b>Pollutant Requirements Applicable?</b>	Yes
<b>Hydrologic Unit</b>	Sandy Creek, HUC12 030300020601
<b>Nutrient Loading Calculations</b>	<i>Provided electronically – See JFLSAT</i>
<b>Offsite Nutrient Reductions</b>	<i>Provided electronically – See Nutrient Reporting Form</i>
<b>BMPs Proposed</b>	None
<b>Required Treatment for the Project</b>	N and P removal
<b>Put SW Condition on CO Signoff (Non-Single Family Residential)?</b>	Not needed

The Stormwater Services Division has reviewed the subject site plan and has the following comments:

1. Please note that the Soils Survey map copy must be from the print version of the Durham County Soil Survey; digital representations alone, such as those from the Web Soil Survey, are not acceptable because they do not show streams.  
**RESPONSE: Print version has replaced Digital version and streams are showing.**
2. It appears from City aerial photography that Chiller Plant #1 was built between 1999 and 2002, and that further changes occurred between 2002 and 2005.
  - a. Why does the 2- and 10-year Site Plan Tracking Table for Sub-Basin 28 not show these changes? Was the site plan for the chiller plant first submitted prior to 2- and 10-year peak flow Baseline Date of 4/23/1997?  
**RESPONSE: The Duke SIA has been revised to include the additional BUA in sub-basin 28/28A that was not on the original site plan for the Chiller Plant. The delineation of the additional 0.13 ac. of impervious along with the Duke SIA updates are described in the revised SIA sheets and letter from McAdams.**

- b. For nutrients, when using the ordinance Section 70-740(c) compliance alternative, the pre-development load in the Jordan/Falls Lake Stormwater Accounting Tool (JFLSAT) must be calculated as of the Jordan Lake applicable baseline date of 12/31/2001, not current land uses. A project can be considered existing as of this Baseline Date if the site plan was first accepted for review before that date.

**RESPONSE: The additional BUA is included in the project boundary. The Jordan Falls spreadsheets have been updated to include this additional BUA. The Water Quality Tracking spreadsheet has also been updated.**

3. Please provide pre- and post-development land use maps for the nutrient calculations, to scale no smaller than 1 inch = 100 feet. The maps shall show the map scale, north arrow, and are to have the different land uses indicated in the JFLSAT either hatched or shaded with land use coding indicated in a legend on the maps. Please ensure all land uses are shown in the legend. Also, please ensure the area in SF associated with each land use is noted on the exhibit. *The pre- and post-development maps provided could be altered just slightly to fulfill this need.*

**RESPONSE: The pre- and post- development maps have been altered to show land use as required. Note, the pre-development map is not showing the existing condition land use areas that are present at the site now; it is showing land use areas from the original site plan from 2001. This was done to match the JFLSAT so that the impervious areas added in 2005 are now accounted for in the proposed land use areas. Since the original site plan from 2001 is now being used as the baseline to compare to, those land use areas are shown on the pre-development map.**

4. I am curious as to why the open space in the post-development scenario in the JFLSAT is being classified as "Unmanaged (pasture)" rather than "INDUSTRIAL Open/Landscaped". There is a higher nutrient loading associated with this use, and all the other uses on site are classified as "INDUSTRIAL".

**RESPONSE: We have updated the Jordan Falls spreadsheet to show the open area as "Industrial Open/Landscape".**

5. The version of the Nutrient Reporting Form that was used was not the most current. Please use the version posted on our website at <http://durhamnc.gov/ich/op/pwd/storm/Pages/SWDevReview.aspx> . Use of the current version will change the results.

**RESPONSE: Updated Form has been used.**

6. Please remove the Section V Peak Discharge Flow Calculations material. All 1-, 2-, and 10-year peak flow modeling for all Duke projects is done by McAdams. This is already addressed in the Section III Stormwater Impact Analysis material.

**RESPONSE: Section V Peak Discharge Flow Calculations have been removed.**

7. Similarly, please remove the Tc flow paths from the pre- and post-development maps.

**RESPONSE: Tc flow paths have been removed.**

8. On the Site Utility Plan, please indicate where the wall drain discharges to. I believe we talked about this at a meeting and the wall drain is essentially like a weep hole that releases water to the pavement, whereupon it just sheet flows across the pavement. Please indicate this on the drawing.

**RESPONSE: Drainage exits through the wall through weep holes and sheet flows across the pavement. Weep hole locations have been called out on C-201.**

9. Graveled or paved areas that have supported vehicles or other weight are typically compacted down into the subgrade and are considered impervious. If this area is being included in the post-development "non-impervious" surface area, merely removing the gravel and putting sod on top will not render this area pervious. Please mark the boundaries of the area to be converted from

impervious to pervious surface and include the following note:

"The proper procedure for compacted soil remediation is as follows.

- a. Remove all impervious surfaces from the subject area.
- b. Till the area to a depth of 12" below the top of compacted subgrade.
- c. Suitable rates and types of soil amendments should be determined through soil tests. Limestone and fertilizer should be applied uniformly during seedbed preparation and mixed well with the top 4 to 6 inches of soil."

**RESPONSE: The above notes have been added to the site plan (C-202) and called out in plan where applicable. The area has been outlined with a dashed line in plan and called out and added to the legend.**

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**COUNTY SOIL & EROSION CONTROL**

**Chris Roberts 560-0739**

5/26/2015

- Erosion Control Group
  1. General Comment: This project meets the Durham City/County Erosion Control UDO for site plan review.
- Open Space Group
  1. General Comment: This project meets the Durham City/County UDO for Open Space Requirements.

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**CITY FIRE**

**Tom Darling 560-1199**

5/27/15 First Review

Site plan needs to include all required elements of Section 3406.5.1 of the NC Fire Code pertaining to the bulk transfer of liquids between the tank vehicle and storage tank.

**RESPONSE: The following changes have been made to address 3406.5.1:**

- **Called out location of mobile fueling to clarify that it is further than 15' from any buildings on C-202**
- **No weather canopy will be provided. No mechanical ventilation will be required; natural ventilation is effective for the application.**
- **Called out "No Smoking Within 25 Feet of Tank" signage on C-202.**
- **Detailed what provisions have been provided for spill control on C-201. Spill containment area is called out in plan, and Note 2 has been added detailing requirements.**
- **A 5' tall fence around the fueling area has not been provided. Per 3406.5.1.18 Exception: no fence is necessary due to the site's isolation and natural barriers from the public.**

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**COUNTY STORMWATER**

**Chris Roberts 560-0739**

5/26/2015

- Stormwater Group
  1. General Comment: This project will be reviewed by the City of Durham's Stormwater Group.

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**COUNTY FIRE MARSHAL**

**Craig Zglinski 560-0662**

[Date of comments]

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**SOLID WASTE**

**Mike Simpson 560-4186 ext. 32248**

[5/22/15] Approved.

**NC DOT**

**919-220-4750**

[Date of comments]

**INSPECTIONS**

**Carlos Diaz 560-4144 ext. 26287**

5/25/15; 1st review; D1500101 – Duke University Central Generation Plant #3

- 1) Please add the following note to the site plan: "The SITE will be fully compliant with the North Carolina Accessibility Codes (ANSI 117.1 -2009 and Chapter 11 of the NCBC) unless and except in areas where an approved statement from a site engineer, surveyor or architect verifies that site conditions exist where the topography of the site is extreme and only alternate methods of compliance are possible." (This is a standard note which must be on all site plans, regardless of site plan scope)

**RESPONSE: Note has been added to the site plan. See sheets C-201 and C-202. Note has also been added to G-001 in the General Notes and Conditions of Approval section.**

**URBAN FORESTRY**

**Alex Johnson 560-4197 ext 21275**

[Date of comments]

**COUNTY UTILITY DIVISION**

**Ted Credle 560-9039**

[Date of comments]

**WATER MANAGEMENT**

**Crystal Penton 560-4381 ext. 35284**

5/11/2015 - Approved

**GIS/ADDRESSING**

**Lenora Melton 560-4122 ext 33233**

[Date of comments]

**PARKS & RECREATION**

**Rosetta Radtke 560-4355 ext. 27208**

[Date of comments]

**COUNTY OPEN SPACE & REAL ESTATE**

**Jane Korest 560-7955**

[Date of comments]

**ADVISORY COMMENTS**

**Please note that comments from advisory boards and departments**

are suggestions, except when code-based.

**POLICE**

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[Date of comments]

**BICYCLE/PEDESTRIAN ADVISORY COMMITTEE**

**[bpac.devrev@durhamnc.gov](mailto:bpac.devrev@durhamnc.gov)**

[Date of comments]

**DOST**

**[Helen Youngblood/Annette Montgomery 560-4137 ext. 28245](mailto:Helen.Youngblood@durhamnc.gov)**

[Date of comments]

**GENERAL INFORMATION:**

**Re-Submittal of Corrected Plans:**

1. Plans submitted for subsequent reviews should be returned to the Planning Department for distribution. Corrected plans must include the issued comments with a written response indicating how and where the comment is addressed on the revised plans.
2. Revised plans should be highlighted or “clouded” to clearly distinguish corrections or changes made, even when the changes were not directly in response to the corrections. **Plans without the highlighted changes on the plan and comments without written response for each comment will not be accepted for re-review.**
3. Please provide one paper copy for each department with outstanding comments to the Planning Department except as noted below. Paper copies should be **folded** and banded with a copy of the responses. Only one CD (*Compact Disc*) is required for all departments accepting electronic copies. Electronic copies should be provided on a CD as a single file in PDF format. The CD should also include a PDF copy of comments with written responses.
  - **Note: The following departments accept electronic plans:** City Fire Marshal, Parks and Recreation, Urban Forestry, Planning Design Compliance, GIS/Addressing, Planning Commission, Police, DOST, Bike/Ped, Soil and Water.

**Resubmittal Deadlines:**

1. The Unified Development Ordinance requires that plans be returned within 90 days of the last comments issued. Plans submitted to address a Notice of Violation (NOV) shall be returned within 30 days of the last comments issued. If not submitted within this time period, the case will be considered withdrawn and the applicant must resubmit a new application package for review.

2. Please contact the Planning Department case planner (indicated above) with any questions about the submittal and review process.

**Final Plan Approval:**

When all comments have been addressed and approved by all departments, please provide at least six copies of the corrected plans to the case planner for approval stamp and signature.



Duke UNIVERSITY

DUKE CENTRAL GENERATION PLANT #3

LEVEL 3 SITE PLAN  
CASE NUMBER: D1500101  
JULY 14, 2015  
SECOND SUBMISSION

PUBLIC WORKS  
CONDITIONS OF APPROVAL

- THE DESIGNING PROFESSIONAL (A NCPE, NCPLS OR NCPLA - AS REQUIRED) SHALL SUBMIT THREE (3) SETS OF CONSTRUCTION DRAWINGS TO THE PUBLIC WORKS DEPARTMENT - DEVELOPMENT REVIEW FOR REVIEW AND APPROVAL. CONSTRUCTION DRAWING APPROVAL IS REQUIRED PRIOR TO COMMENCING CONSTRUCTION (SEE CONSTRUCTION PLAN APPROVAL PROCESS). THE APPROVAL OF CONSTRUCTION DRAWINGS IS SEPARATE FROM SITE PLAN APPROVAL. CITY OFFICIALS SHALL REVIEW ALL SIZES, MATERIALS, SLOPES, LOCATIONS, EXTENSIONS AND DEPTHS FOR ALL PROPOSED UTILITIES (WATERLINES, SANITARY SEWER LINES AND STORM DRAINAGE CONVEYANCE SYSTEMS) FOR COMPLIANCE WITH ALL APPLICABLE REGULATORY STANDARDS, SPECIFICATIONS, AND BEST MANAGEMENT PRACTICES.
- THE DESIGNING PROFESSIONAL (A NCPE, NCPLS OR NCPLA - AS REQUIRED) SHALL SUBMIT ONE (1) SET OF AS-BUILT DRAWINGS TO THE PUBLIC WORKS DEPARTMENT - DEVELOPMENT REVIEW FOR REVIEW AND APPROVAL.
- HORIZONTAL AND VERTICAL SEPARATION
  - SANITARY SEWERS SHALL BE LAID AT LEAST 10- FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE. IN CASES WHERE IT IS NOT PRACTICAL TO MAINTAIN A 10-FOOT SEPARATION, THE CITY OF DURHAM MAY ALLOW DEVIATION ON A CASE-BY-CASE BASIS, IF SUPPORTED BY DATA FROM THE DESIGN ENGINEER. SUCH DEVIATION ON MAY ALLOW THE INSTALLATION OF THE SANITARY SEWER CLOSER TO A WATER MAIN, PROVIDED THAT THE WATER MAIN IS IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SANITARY SEWER AND AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST 18-INCHES ABOVE THE TOP OF THE SEWER.
  - IF IT IS IMPOSSIBLE TO OBTAIN PROPER HORIZONTAL AND VERTICAL SEPARATION AS DESCRIBED ABOVE, OR ANYTIME THE SANITARY SEWER IS OVER THE WATER MAIN, BOTH THE WATER MAIN AND SANITARY SEWER MUST BE CONSTRUCTED OF FERROUS PIPE, COMPLYING WITH THE PUBLIC WATER SUPPLY DESIGN STANDARDS AND BE PRESSURE TESTED TO 150-PSI TO ASSURE WATER TIGHTNESS BEFORE BACKFILLING.
  - A 24-INCH VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN STORM SEWER AND SANITARY SEWER LINES OR FERROUS PIPE SPECIFIED. A 12-INCH VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN STORM SEWER AND WATER MAINS.
    - IF A 12-INCH VERTICAL SEPARATION IS NOT MAINTAINED AT A CROSSING BETWEEN STORM SEWER AND WATER MAINS (OR PRESSURE SEWERS), THE WATER MAIN SHALL BE CONSTRUCTED OF FERROUS PIPE AND A CONCRETE COLLAR SHALL BE POURED AROUND WATER MAINS AND STORM SEWER TO IMMOBILIZE THE CROSSING.
- CROSSINGS
  - SANITARY SEWER CROSSING WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18-INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SANITARY SEWER. THE CROSSING SHALL BE ARRANGED SO THAT THE SANITARY SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.
  - IF IT IS IMPOSSIBLE TO OBTAIN PROPER HORIZONTAL AND VERTICAL SEPARATION AS STIPULATED ABOVE, ONE OF THE FOLLOWING METHODS MUST BE SPECIFIED:
    - THE SANITARY SEWER SHALL BE DESIGNED AND CONSTRUCTED OF FERROUS PIPE AND SHALL BE PRESSURE TESTED AT 150-PSI TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING, OR
    - EITHER THE WATER MAIN OR THE SANITARY SEWER LINE MAY BE ENCASED IN A WATERTIGHT CARRIER PIPE, WHICH EXTENDS 10- FEET ON BOTH SIDES OF THE CROSSING, MEASURED PERPENDICULAR TO THE WATER MAIN. THE CARRIER PIPE SHALL BE OF MATERIALS APPROVED BY THE CITY OF DURHAM FOR USE IN WATER MAIN CONSTRUCTION.

GENERAL NOTES AND  
CONDITIONS OF APPROVAL

- THIS SITE IS NOT IN ANY SPECIAL FLOOD HAZARD AREAS OR FUTURE CONDITIONS FLOOD HAZARD AREAS, AS SHOWN ON FIRM PANEL 3720081100J DATED MAY 2, 2006.
- STREAM BUFFERS: 50 FOOT WIDE UNDISTURBED STREAM BUFFER, MEASURED FROM TOP OF BANK, EACH SIDE OF STREAM. NO CLEARING OR GRADING OTHER THAN SELECTIVE THINNING AND ORDINARY MAINTENANCE OF EXISTING VEGETATION PERMITTED, EXCEPT IN ACCORDANCE WITH 15A NCAC 02B.233 (4) VEGETATION MANAGEMENT. NO STRUCTURES OR FEATURES REQUIRING GRADING OR CONSTRUCTION MAY BE BUILT WITHIN THE 10 FOOT STREAM BUFFER SETBACK. ANY USE ALLOWED BY SECTION 8.5.9 OF THE UDO SHALL BE DESIGNED AND CONSTRUCTED TO MINIMIZE THE AMOUNT OF INTUSION INTO THE STREAM BUFFER AND TO MINIMIZE CLEARING, GRADING, EROSION AND WATER QUALITY DEGRADATION (UDO SECTION 8.5).
- TREE PROTECTION NOTE (UDO SEC. 8.3): TREE PROTECTION FENCING MUST BE IN PLACE PRIOR TO ANY DEMOLITION, LAND DISTURBANCE, OR ISSUANCE OF A GRADING PERMIT AND SHALL INCLUDE WARNING SIGNS POSTED IN BOTH ENGLISH AND SPANISH, AS FOLLOWS: NO TRESPASSING/TREE PROTECTION AREA/PROHIBIDO ENTRAR / ZONA PROTECTORA PARA LOS ARBOLES. IF TREE PROTECTION IS REQUIRED, A TREE PROTECTION CERTIFICATION MUST BE SUBMITTED TO THE DURHAM COUNTY EROSION CONTROL DIVISION, AND A TREE PROTECTION INSPECTION COMPLETED PRIOR TO THE ISSUANCE OF A LAND-DISTURBANCE PERMIT.
- IF >12,000 SF OF DISTURBANCE OCCURS, A LAND-DISTURBING PERMIT WILL BE REQUIRED PRIOR TO THE COMMENCEMENT OF ANY LAND-DISTURBING ACTIVITY.
- IF MORE THAN 20,000 SQ. FT. IS DISTURBED, A SEDIMENTATION AND EROSION CONTROL PLAN MUST BE SUBMITTED AND APPROVED PRIOR TO THE ISSUANCE OF A LAND-DISTURBANCE PERMIT.
- TREE PROTECTION IS REQUIRED BY THE CITY/ COUNTY PLANNING DEPARTMENT. TREE PROTECTION CERTIFICATION MUST BE SUBMITTED TO THE DURHAM COUNTY EROSION CONTROL DIVISION, AND TREE PROTECTION INSPECTION COMPLETED PRIOR TO LAND-DISTURBANCE PERMIT ISSUANCE.
- IF AN OFFSITE SPOIL OR BORROW SITE IS UTILIZED, THE DISTURBED AREA MUST BE INCLUDED IN THE LAND DISTURBANCE PLAN AND PERMIT UNLESS ALREADY PERMITTED.
- IF THE DISTURBED AREA EXCEEDS FIVE ACRES, AN IMPROVEMENT SECURITY WILL BE REQUIRED PRIOR TO LAND-DISTURBING PERMIT ISSUANCE.
- THE SITE WILL BE FULLY COMPLIANT WITH THE NORTH CAROLINA ACCESSIBILITY CODES (ANSI 117.1-2008 AND CHAPTER 11 OF THE NCBC) UNLESS AND EXCEPT IN AREAS WHERE AN APPROVED STATEMENT FROM A SITE ENGINEER, SURVEYOR OR ARCHITECT VERIFIES THAT SITE CONDITIONS EXIST WHERE THE TOPOGRAPHY OF THE SITE IS EXTREME AND ONLY ALTERNATE METHODS OF COMPLIANCE ARE POSSIBLE.

SPECIAL CONDITIONS  
OF APPROVAL

- OWNER/DEVELOPER SHALL NOTIFY THE DURHAM CITY COUNTY PLANNING DEPARTMENT SITE COMPLIANCE STAFF AT THE COMPLETION OF CONSTRUCTION AND LANDSCAPING TO REQUEST AN INSPECTION PRIOR TO USE OF THE FACILITY.

REVISION TO  
APPROVED PLANS

SITE DETERMINATIONS

CASE NUMBER D1500101 APPROVALS

PIN: 0811-05-69-9253.L00

SITE DATA TABLE

DEVELOPMENT NAME:	DUKE CENTRAL GENERATION PLANT #3		
PROPERTY ADDRESS:	2300 DUKE UNIVERSITY ROAD, DURHAM, NORTH CAROLINA 27705		
PROPERTY IDENTIFICATION			
APRN:	0811-05-69-9253.L00		
PARCEL ID:	108792		
TAX MAP NO:	18952		
ZONING DISTRICTS	University/College		
OVERLAY DISTRICT:	NONE		
PARCEL SIZE:	680.42 AC.		
PROJECT SIZE:	43 AC.		
LIMITS OF DISTURBANCE:	43 AC.		
JURISDICTION:	CITY OF DURHAM		
DEVELOPMENT TIER:	URBAN		
WATERSHED/OVERLAY:	N/A		
RIVER BASIN:	CAPE FEAR		
PROPOSED BUILDING USE:	N/A		
EXISTING BUILDING			
(Sq. ft. gross):	N/A		SF
TOTAL			SF
PROPOSED BUILDING:			
(Sq. ft. gross):	N/A		SF
NET REDUCTION		0	SF
PROPOSED BUILDING HEIGHT:			FT
TREE COVERAGE:			
SITE DISTURBANCE	18,592		SF
REQUIRED COVERAGE	N/A		SF
PROPOSED COVERAGE	N/A		SF
RESERVE	N/A		SF
RESTORATION (STREAM BUFFER)	N/A		SF
PARKING REQUIREMENT:			
EXISTING PARKING SPACES	6		
PROPOSED PARKING SPACES	6		
NET CHANGE (REDUCTION)	0		
IMPERVIOUS AREA:			
PRE-DEV IMPERVIOUS	6,624		SF
POST-DEV IMPERVIOUS	12,046		SF
NET CHANGE (ADDITION)	5,422		SF
CLIENT:	DUKE UNIVERSITY- MYRON TASCHUK 114 SOUTH BUCHANAN BLVD, BOX 30044 DURHAM, NORTH CAROLINA 27617 PH: 919-941-9876 EMAIL: myron.taschuk@duke.edu		
CONSULTANT:	RMF ENGINEERING, INC. - MATTHEW BOATWRIGHT 8081 ARCO CORPORATE DR., STE. 300 RALEIGH, NORTH CAROLINA 27617 PH: 919-941-9876 EMAIL: matthew.boatwright@rmf.com		

SITE PLAN SUBMISSION

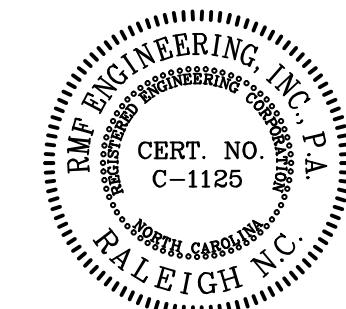
INDEX OF DRAWINGS

DWG. NO.	TITLE
G-001	TITLE SHEET
C-001	EXISTING CONDITIONS AND TESTHOLE PLAN
C-101	DEMOLITION PLAN
C-201	SITE UTILITIES PLAN
C-202	SITE RESTORATION & GRADING PLAN
C-401	CIVIL DETAILS

1				
1	1ST REVIEW COMMENTS	07/14/15	MSB	
ZONE	REV	DESCRIPTION	DATE	APPROVED

THIS DRAWING AND ALL COPIES THEREOF IS THE PROPERTY OF RMF ENGINEERING, INC. THIS DRAWING MAY NOT BE USED OR REPRODUCED WITHIN ANY COMPUTER ENVIRONMENT OR BY ANY PRINT MEDIA FORMAT WITHOUT THE WRITTEN CONSENT OF RMF ENGINEERING, INC.

SCALE:	NONE	DATE:	JULY 14, 2015
DRAWN BY:	MJK	RMF JOB NO.:	214390.A0
DESIGNED BY:	JDE	FILE:	4390-0001 COD.dwg
CHECKED BY:	JDE	PROJ. MGR:	MAD



Duke UNIVERSITY

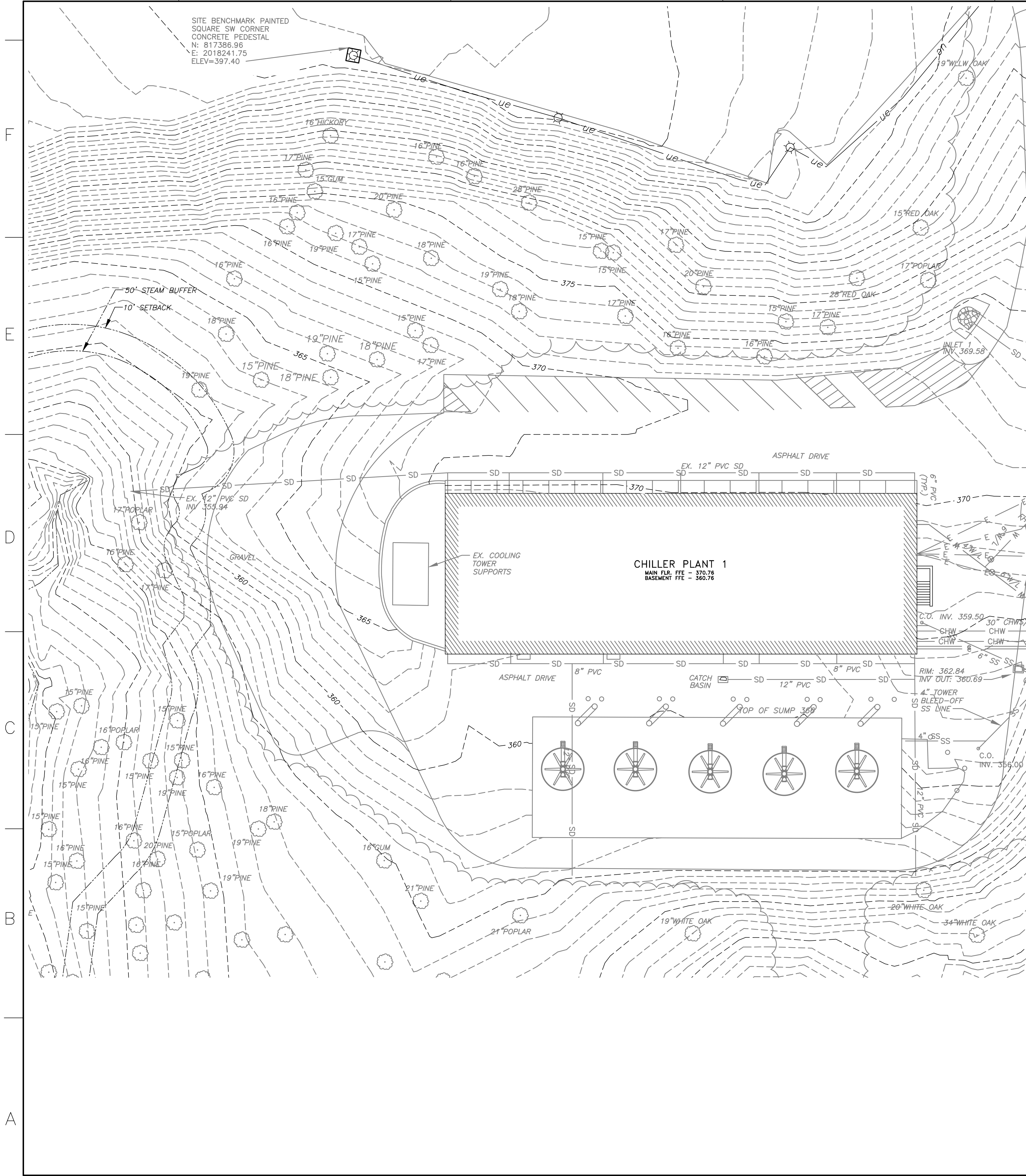
TITLE SHEET

rmf RMF ENGINEERING, INC.  
8081 ARCO CORP. DR., STE 300  
RALEIGH, NC 27617  
P: 919.941.9876 www.rmfi.com

G-001



P:\NC\14\214390A0\Drawings\4390\_C001.dwg  
MATTHEW BOATWRIGHT  
7/13/2015 5:01 PM



DRAWING LEGEND	
EXISTING CONDITIONS LEGEND	
SYMBOL	DESCRIPTION
	EXISTING BUILDING
	EX. CURB AND GUTTER
	EX. FENCE
	EX. ASPHALT PAVEMENT
<b>EX. PROPERTY LINE</b>	<b>EX. PROPERTY LINE</b>
	EX. RIGHT-OF-WAY
	EXISTING STREAM
	EX. WALL
	EX. CONCRETE SIDEWALK
	EX. INTERMEDIATE CONTOUR
	EX. INDEX CONTOUR
	EX. SPOT ELEVATION
	EX. TREE
	EX. SIGN
	EX. LIGHT POLE
	EX. STAIRS
	EX. CHILLED WATER VALVE
	EX. CHILLED WATER SUPPLY / RETURN
	EX. CONDENSER WATER SUPPLY / RETURN
	EX. STORM DRAIN
	EX. STORM DRAIN MANHOLE
	EX. STORM DRAIN INLET
	EX. SANITARY SEWER
	EX. SANITARY SEWER MANHOLE
	EX. COMMUNICATIONS DUCTBANK
	EX. COMMUNICATIONS CONDUIT
	EX. COMMUNICATIONS STRUCTURE
	EX. POWER DUCTBANK
	EX. POWER CONDUIT
	EX. POWER STRUCTURE
	EX. UTILITY POLE
	EX. WATER PIPING
	EX. WATER VALVE
	EX. SIAMESE CONNECTION
	EX. FIRE HYDRANT

- PIN: 0811-05-69-9253.L00
- BENCHMARK:**
- BM-1  
LOCATED ON SW CORNER OF CONCRETE LIGHTPOLE PEDESTAL IN PARKING LOT WEST OF CHILLER PLANT.  
N: 817386.96  
E: 2018241.75  
ELEVATION: 397.40
- GENERAL NOTES:**
- CONTRACTOR IS RESPONSIBLE FOR LOCATION OF ALL UTILITIES. LOCATIONS SHOWN ARE APPROXIMATE AND TAKEN FROM AVAILABLE RECORDS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL UNDERGROUND UTILITIES. CONTRACTOR SHALL CONTACT ALL LOCAL UTILITY AUTHORITIES, AS REQUIRED, AT LEAST 48 HOURS PRIOR TO ALL EXCAVATION.
  - INFORMATION CONCERNING EXISTING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS. CONTRACTOR IS RESPONSIBLE FOR THE EXACT LOCATION, ELEVATION, AND SIZE OF ALL EXISTING UNDERGROUND UTILITIES OR DUCT BANKS, AT ALL UTILITY CROSSINGS.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR AND IMMEDIATELY NOTIFY THE OWNER AND EOR UPON ANY OMISSIONS AND/OR ADDITIONS OF UTILITIES FOUND DURING EXCAVATION.
  - CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES. ANY DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SHALL NOT RESULT IN ANY EXTRA COST.
  - WHEN WORKING IN AND AROUND THE EXISTING BUILDINGS OR STRUCTURES, EXTREME CARE SHALL BE EXERCISED WITH REGARD TO PROTECTION OF THE EXISTING STRUCTURE AND SERVICES WHICH WILL REMAIN. REPAIR, REPLACE, OR RESTORE TO THE SATISFACTION OF THE OWNER.
  - DURING CONSTRUCTION AND UPON COMPLETION OF WORK, CONTRACTOR SHALL REMOVE ALL EVIDENCE OF WORK INCLUDING DIRT, ASPHALT, TIRE TRACKS, ETC. AND LEAVE THE SITE IN A CLEAN AND ORDERLY CONDITION. DURING AND UPON COMPLETION, CONTRACTOR SHALL SWEEP ASPHALT PAVEMENT AND CONCRETE SIDEWALK, AND KEEP THE SITE IN A NEAT AND ORDERLY CONDITION. ALL MUD AND CONSTRUCTION DEBRIS IS TO BE REMOVED IMMEDIATELY FROM ROAD. CONTRACTOR MAY INSTALL STABILIZED CONSTRUCTION ENTRANCE TO SITE AS REQUIRED. ENTRANCE MAY NOT IMPEDE REQUIRED TRAFFIC LANES TO REMAIN OPEN.
  - CONTRACTOR SHALL BE REQUIRED TO RESTORE ALL PAVEMENTS, CURBS, GUTTERS, SIDEWALKS, SIGNS, AND PAVEMENT STRIPING NOT SHOWN ON DEMOLITION/RESTORATION PLANS TO THEIR ORIGINAL PRE CONSTRUCTION CONDITION FOR ALL AREAS DISTURBED DURING CONSTRUCTION AT NO ADDITIONAL COST TO OWNER.
  - CONTRACTOR SHALL INSTALL 6' HIGH TEMPORARY CHAIN LINK FENCING, WITH CONCRETE BOOTS/ANCHORS SURROUNDING CONSTRUCTION AREA, FOR THE DURATION OF CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MODIFYING FENCING AS REQUIRED BY PHASING REQUIREMENTS.
  - CONTRACTOR IS RESPONSIBLE FOR ALL SHORING AND SUPPORT. WORKING AROUND EXISTING UTILITIES, EXCAVATING, SHORING, AND SUPPORTING IS CONSIDERED MEANS AND METHODS. CONTRACTOR IS REQUIRED TO FOLLOW OSHA AND ANY GOVERNING AGENCY REGULATIONS.

## SITE PLAN SUBMISSION

ZONE	REV	DESCRIPTION	DATE	APPROVED
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### REVISIONS

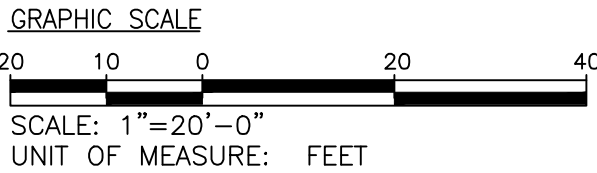
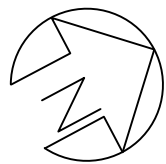
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DESIGNED BY:	CMP	FILE:	4390_C001.dwg	
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EXISTING CONDITIONS

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C-001





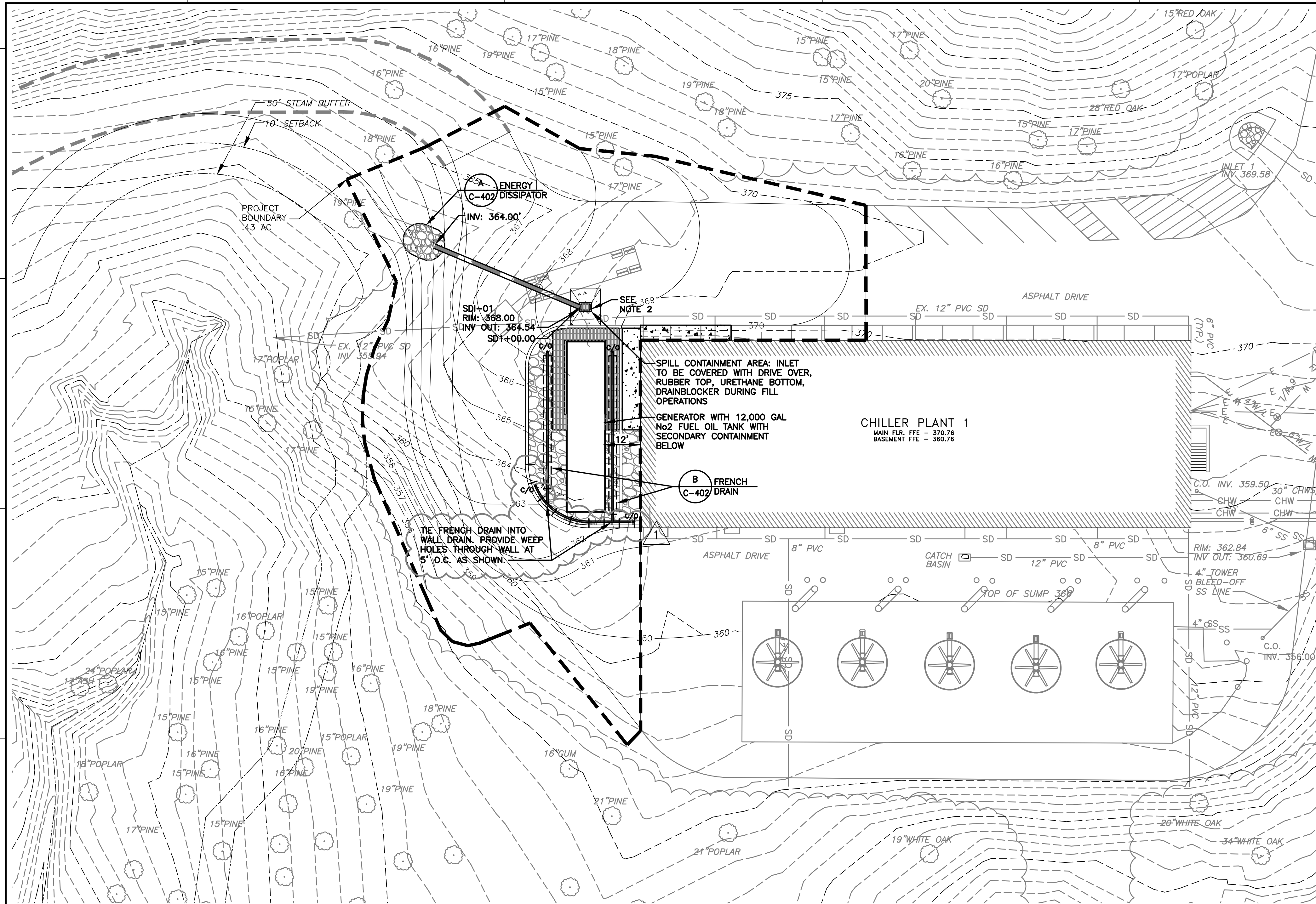




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MATTHEW BOATWRIGHT

7/13/2015 5:01 PM



DRAWING LEGEND	
UTILITIES LEGEND	
SYMBOL	DESCRIPTION
	15" SD
	FRENCH DRAIN
	STORM DRAIN YARD INLET
	STORM DRAIN CLEANOUT
	RIPRAP ENERGY DISSIPATOR
	PROJECT BOUNDARY - LIMITS OF DISTURBANCE

PIN: 0811-05-69-9253.L00

**BENCHMARK:**

1. BM-1  
LOCATED ON SW CORNER OF CONCRETE LIGHTPOLE PEDESTAL  
IN PARKING LOT WEST OF CHILLER PLANT.  
N: 817386.96  
E: 2018241.75  
ELEVATION: 397.40

**GENERAL NOTES:**

1. THE SITE WILL BE FULLY COMPLIANT WITH THE NORTH CAROLINA ACCESSIBILITY CODES (ANSI 117.1-2009 AND CHAPTER 11 OF THE NCBC) UNLESS AND EXCEPT IN AREAS WHERE AN APPROVED STATEMENT FROM A SITE ENGINEER, SURVEYOR OR ARCHITECT VERIFIES THAT SITE CONDITIONS EXIST WHERE THE TOPOGRAPHY OF THE SITE IS EXTREME AND ONLY ALTERNATE METHODS OF COMPLIANCE ARE POSSIBLE.

2. SPILL CONTAINMENT AREA: INLET TO BE COVERED WITH DRIVE OVER, RUBBER TOP, URETHANE BOTTOM, DRAINBLOCKER DURING FILL. DEPRESSED AREA IS SIZED FOR SPILL CONTROL. SECONDARY SPILL CONTAINMENT IS LOCATED BELOW GENERATOR. ALSO PROVIDE AN OUTDOOR CONTAINER LABELED SPILL CONTROL THAT CONTAINS THE FOLLOWING: ABSORBENT MATERIALS, NON-WATER ABSORBENT PADS, A 10' LONG CONTAINER WITH LID AND A NONMETALLIC SHOVEL TO MITIGATE A MINIMUM 5 GALLON FUEL SPILL.

## SITE PLAN SUBMISSION

ZONE	REV	DESCRIPTION	DATE	APPROVED
1	1ST REVIEW COMMENTS		07/14/15	MSB

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SITE UTILITY PLAN

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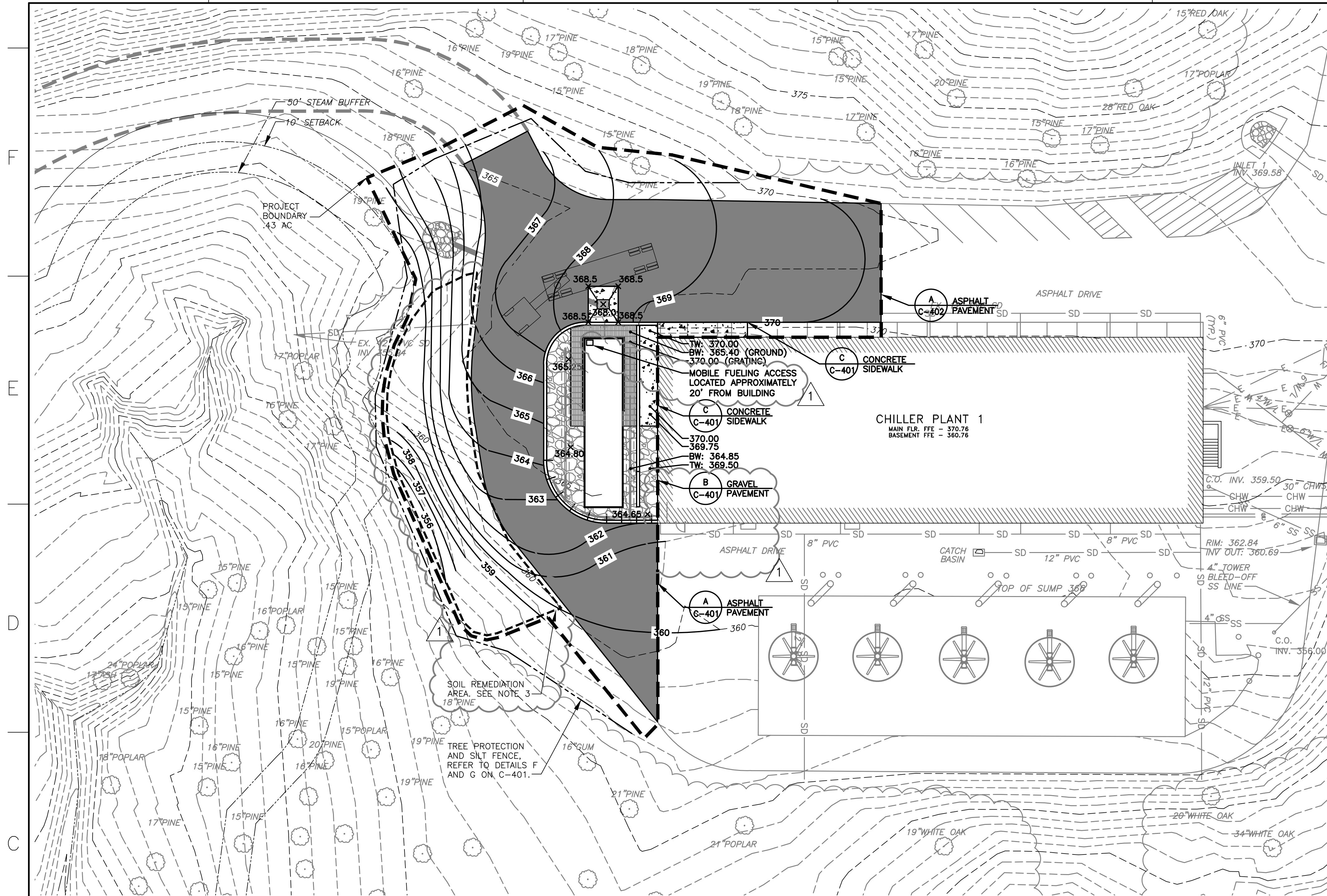
C-201



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MATTHEW BOATWRIGHT

7/13/2015 5:02 PM



DRAWING LEGEND	
RESTORATION LEGEND	
SYMBOL	DESCRIPTION
	ASPHALT PAVEMENT
	CONCRETE SIDEWALK / PAD
	METAL GRATING
	CONCRETE RETAINING WALL
	METAL STAIRS AND GRATING
	INDEX CONTOUR
	INTERMEDIATE CONTOUR
	SPOT ELEVATION
	PROJECT BOUNDARY - LIMITS OF DISTURBANCE
	TREE PROTECTION AND SILT FENCE
	SOIL REMEDIATION AREA. SEE NOTE 3

PIN: 0811-05-69-9253.L00

**BENCHMARK:**

1. BM-1  
LOCATED ON SW CORNER OF CONCRETE LIGHTPOLE PEDESTAL IN PARKING LOT WEST OF CHILLER PLANT.  
N: 817386.96  
E: 2018241.75  
ELEVATION: 397.40

**GENERAL NOTES:**

1. CONTRACTOR IS RESPONSIBLE FOR REPAIRING AND REPLACING AT NO ADDITIONAL COST, ANY AREAS DAMAGED ON SITE DUE TO CONSTRUCTION, INCLUDING, BUT NOT LIMITED TO, CURB, ASPHALT, SIDEWALKS, SITE FURNISHINGS, LIGHT/POWER POLES, SIGNAGE, EXISTING UTILITIES, ETC. TO THE SATISFACTION OF THE OWNER AND ENGINEER.

2. CONTRACTOR SHALL RESTRIPE ALL NEW ASPHALT PAVEMENT TO MATCH EXISTING

3. THE PROPER PROCEDURE FOR SOIL REMEDIATION IS AS FOLLOWS:  
A. REMOVE ALL IMPERVIOUS SURFACES FROM THE SUBJECT AREA.  
B. TILL THE AREA TO A DEPTH OF 12" BELOW THE TOP OF COMPACTED SUBGRADE.  
C. SUITABLE RATES AND TYPES OF SOIL AMENDMENTS SHOULD BE DETERMINED THROUGH SOIL TEST. LIMESTONE AND FERTILIZER SHOULD BE APPLIED UNIFORMLY DURING PLANTING AND MIXED WELL WITH THE TOP 4 TO 6 INCHES OF SOIL.

4. PROVIDE SIGN READING "NO SMOKING WITHIN 25' OF GENERATOR." MOUNT SIGN IN VISIBLE LOCATION ADJACENT TO GENERATOR TANK FILLING ACCESS.

## SITE PLAN SUBMISSION

ZONE	REV	DESCRIPTION	DATE	APPROVED
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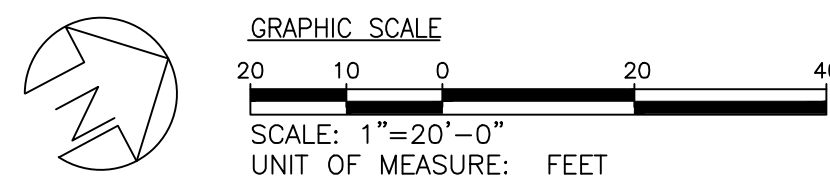
07/13/15



## SITE RESTORATION AND GRADING PLAN

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C-202





 HEAVY DUTY ASPHALT PAVING  
C202 | C401 SCALE: NONE

 **GRAVEL PAVEMENT**  
SCALE: NONE

 **CONCRETE SIDEWALK**  
SCALE: NONE

 **FRENCH DRAIN**  
SCALE: NONE

 **RIPRAP ENERGY DISSIPATOR**  
SCALE: NONE

TO INCREASE STORAGE CAPACITY AND PROLONG THE LIFE OF THE SILT FENCE, IT IS GENERALLY ADVISABLE TO DIG A SEDIMENT PIT IN FRONT OF THE SILT FENCE WHENEVER POSSIBLE.

NOT TO SCALE



EROSION CONTROL DETAIL  
DURHAM COUNTY, NC  
ENGINEERING DEPARTMENT

REV:

TEMPORARY SILT FENCE

DATE	ID
02/09	SF-1

SIDE VIEW

FRONT VIEW

### WARNING SIGN DETAIL

NOTES:

WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.

LETTERS TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAKED.

SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVAL.

PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER.

FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.

ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.

MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.

ADDITIONAL SIGNS MAY BE REQUIRED BASED ON ACTUAL FIELD CONDITIONS.

PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER.

WARNING SIGN DETAIL



EROSION CONTROL DETAIL  
DURHAM COUNTY, NC  
ENGINEERING DEPARTMENT

TREE PROTECTION DETAIL

DATE	ID
02/09	TP-1

 **TREE PROTECTION**  
SCALE: NONE

 **TEMPORARY SILT FENCE**  
SCALE: NONE

PIN: 0811-05-69-9253.L00

SITE PLAN SUBMISSION

[illegible]

ZONE	REV	DESCRIPTION	DATE	APPROVED
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## CIVIL CONSTRUCTION DETAILS



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C-401